ROBO-2530VL

Embedded System Board

User's Manual

P/N:

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Table of Contents

How to Use This Manual

Chapter 1. Introduction + Manual Objectives

1.1 Check List ..... 1 – 2
1.2 Product Specifications ..... 1 – 3
1.2.1 General Functions ..... 1 – 3
1.2.2 CRT Interface ..... 1 – 4
1.2.3 Ethernet Interface ..... 1 – 4
1.2.4 SSD Interface ..... 1 – 4
1.2.5 Expansion Interface ..... 1 – 4
1.2.6 Connectors ..... 1 – 4
1.2.7 Mechanical and Environmental ..... 1 – 5
1.3 System Architecture ..... 1 – 6
1.3.1 CPU/GX1 and CS5530A ..... 1 – 6
1.3.2 XPRESS Graphics ..... 1 – 6
1.3.3 PCI Bus ..... 1 – 6
1.3.4 PC/104 Interface ..... 1 – 7
1.3.5 SDRAM Interface ..... 1 – 7
1.3.6 IDE Interface ..... 1 – 7
1.3.7 USB ..... 1 – 7
1.3.8 Ethernet ..... 1 – 7
1.3.9 Winbond W83977F-A ..... 1 – 8
1.3.10 Compact Flash Interface ..... 1 -- 8

Chapter 2. Hardware Configuration Setting

2.1 Jumper Setting ..... 2 – 2
2.2 Connectors ..... 2 – 3

Chapter 3. System Installation

3.1 Graphic Driver installation for NS Geode GX1 XpressGraphics ... 3 – 1
3.2 Ethernet ..... 3 – 2
3.3 IDE interface ..... 3 – 2
3.4 PCI bus ..... 3 – 2
3.5 SDRAM interface ..... 3 – 2
3.6 USB ..... 3 – 3
3.7 Compact Flash interface ..... 3 – 3
3.8 Winbond W83977F-A & W83977ATF-AW ..... 3 -- 3

Chapter 4. BIOS Setup Information

4.1 Starting Setup ..... 4 – 1
4.2 Using Setup ..... 4 – 2
4.3 Getting Help ..... 4 – 2
4.4 In Case of Problems ..... 4 – 3
4.5 Main Menu ..... 4 – 3
4.5.1 Setup Items ..... 4 – 3
4.5.1.1 Standard CMOS Setup ..... 4 – 3
4.5.1.2 BIOS Features Setup ..... 4 – 4
4.5.1.3 Super / User Password Setting ..... 4 – 4
4.5.1.4 Chipset Features Setup ..... 4 – 4
4.5.1.5 Power Management Setup ..... 4 – 4
4.5.1.6 PNP / PCI Configuration Setup ..... 4 – 4
4.5.1.7 Load BIOS Defaults ..... 4 – 4
4.5.1.8 Load Setup Defaults ..... 4 – 4
4.5.1.9 Integrated Peripherals ..... 4 – 4
4.5.1.10 IDE HDD Auto Detection ..... 4 – 5
4.5.1.11 Save & Exit Setup ..... 4 – 5
4.5.1.12 Exit Without Save ..... 4 – 5
Bios Features Setups Table ..... 4 – 5
Chipset Features Setup Table ..... 4 – 6
Integrated Peripherals Features Setup Table ..... 4 – 6
Power Management Setup Table ..... 4 – 7
PnP/PCI Configuration Setup Table ..... 4 – 7
4.5.2 Standard CMOS Setup ..... 4 – 8
4.5.2.1 Date ..... 4 – 8
4.5.2.2 Time ..... 4 – 8
4.5.2.3 Daylight Saving ..... 4 – 9
4.5.2.4 Primary Master/Primary Slave/Secondary Master ..... 4 – 9
Secondary Slave
4.5.2.5 Drive A Type / Drive B Type ..... 4 – 10
4.5.2.6 Video ..... 4 – 10
4.5.2.7 Halt On ..... 4 – 10
4.5.2.8 Memory ..... 4 – 11
4.5.2.9 Base Memory ..... 4 – 11
4.5.2.10 Extended Memory ..... 4 – 11
4.5.2.11 Other Memory ..... 4 – 11
4.5.3 BIOS Features Setup ..... 4 – 12

4.5.3.1 Virus Warning ..... 4 – 12
4.5.3.2 CPU Internal Cache ..... 4 – 13
4.5.3.3 Quick Power On Self Test ..... 4 – 13
4.5.3.4 Boot Sequence ..... 4 – 13
4.5.3.5 Swap Floppy Drive ..... 4 – 13
4.5.3.6 Boot Up Floppy Seek ..... 4 – 14
4.5.3.7 Boot Up NumLock Status ..... 4 – 14
4.5.3.8 Boot Up System Speed ..... 4 – 14
4.5.3.9 Gate A20 Option ..... 4 – 14
4.5.3.10 Typematic Rate Setting ..... 4 – 15
4.5.3.11 Typematic Rate (Chars/Sec) ..... 4 – 15
4.5.3.12 Typematic Delay (Msec) ..... 4 – 15
4.5.3.13 Security Option ..... 4 – 16
4.5.3.14 PCI / VGA Palette Snoop ..... 4 – 16
4.5.3.15 OS Select for DRAM > 64 ..... 4 – 16
4.5.3.16 Report No FDD for WIN95 ..... 4 – 16
4.5.3.17 Video BIOS Shadow ..... 4 – 16
4.5.3.18 CBFFF Shadow/DC000 - DFFFF Shadow ..... 4 – 17
4.5.3.19 Full Screen Logo Show ..... 4 – 17
4.5.4 Supervisor/User Password Setting ..... 4 – 17
4.5.5 Chipset Features Setup ..... 4 – 18
4.5.5.1 SDRAM CAS latency Time ..... 4 – 18
4.5.5.2 SDRAM Clock Ratio Div By ..... 4 – 18
4.5.5.3 16-bit I/O Recovery (CLK) ..... 4 – 18
4.5.5.4 8-bit I/O Recovery (CLK) ..... 4 – 19
4.5.5.5 USB Controller / USB Legacy Support ..... 4 – 19
4.5.6 Integrated Peripherals Features Setup ..... 4 – 19
4.5.6.1 IDE HDD Block Mode ..... 4 – 19
4.5.6.2 Primary/Secondary IDE Channel ..... 4 – 20
4.5.6.3 IDE Primary/Secondary Master/Slave PIO Mode ..... 4 – 20
4.5.6.4 IDE Primary/Secondary Master/Slave UDMA ..... 4 – 20
4.5.6.5 KBC Input Clock ..... 4 – 20
4.5.6.6 Onboard FDD Controller ..... 4 – 20
4.5.6.7 Onboard Serial Port 1/Port 2 ..... 4 – 20
4.5.6.8 Onboard Serial Port3/Port 4 ..... 4 – 21
4.5.6.9 Onboard Parallel Port ..... 4 – 21
4.5.6.10 Parallel Port Mode ..... 4 – 21
4.5.6.11 ECP Mode Use DMA ..... 4 – 21
4.5.6.12 EPP Mode Select ..... 4 – 21

4.5.6.13 GPIO Port ..... 4 – 22
4.5.7 Power Management Setup ..... 4 – 22
4.5.7.1 Power Management ..... 4 – 23
4.5.7.2 PM Timers ..... 4 – 23
4.5.7.2.1 Doze Mode ..... 4 – 23
4.5.7.2.2 Standby Mode ..... 4 – 23
4.5.7.2.3 HDD Power Down ..... 4 – 24
4.5.7.3 Power Down & Resume Events ..... 4 – 24
4.5.8 PnP/PCI Configuration on Setup ..... 4 – 25
4.5.8.1 PnP OS Installed ..... 4 – 25
4.5.8.2 Resource Controlled By ..... 4 – 25
4.5.8.3 Reset Configuration on Data ..... 4 – 26
4.5.8.4 IRQ – X/DMA – X Assigned To ..... 4 – 26
4.5.8.5 PCI IRQ Activated By ..... 4 – 26

How to Use This Manual

The manual describes how to configure your ROBO-503 system to meet various operating requirements. It is divided into four chapters, with each chapter addressing a basic concept and operation of Embedded Board Computer.

Chapter 1: Introduction. This chapter presents what you have in the inside of box and give you an overview of the product specifications and basic system architecture for this model of single board computer.

Chapter 2: Hardware Configuration Setting. This chapter shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3: System Installation. This chapter describes how to properly mount the CPU and main memory, M-system Flash disk, or optional flat panel display interface module to get a safe installation and give you a programming guide of Watch Dog Timer function. Besides, it will introduce and show you the driver installation procedure about Graphics Controller.

Chapter 4: BIOS Setup Information. This chapter specifies the meaning of each setup parameters and how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give you a guide of trouble-shooting.

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EC Declaration of Conformity

(To Be Added)

For the following equipment:
Product Name:

Model Name:

Trade Name:

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive (89/336/EEC). The equipment was evaluated and passed the test, the following standards were applied :

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	EN 50082-2	(1991)
	EN 61000-4-2	(1995)
	EN 61000-4-3	(1996)
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	EN 61000-3-2	(1995)
	EN 61000-3-3	(1995)

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(Company Address)

Taipei, R.O.C.
Place

Date

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CHAPTER 1

Manual Objectives

This manual describes in detail the Portwell ROBO-2530VL Embedded System Board. This manual aims to provide all necessary information to users who may interest in using all ROBO-2530VL's functions.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

We strongly recommend that you study this manual carefully before attempting to alter ROBO-2530VL's configurations. In the case, something in this manual is not clear or users have any suggestion on this manual. Contact our Customer Service department with the relevant details. Portwell Technical Service Group's web site is http://isc.portwell.com.tw/.

Introduction

The ROBO-2530VL is a compact 3.5" HDD size embedded system board that equips with low-power NS Geode GX1 processor, VGA and single PCI-bus Ethernet interfaces.

This model is very compact with flexible extension. There is a PC104 plus interface, which is cable to extend further. For an embedded system, Watch Dog Timer is also one standard feature. Software programming is the way to set up WDT. It helps to free the system from undesired hanging without human interface. This is unique for many Embedded System applications.

Compact Flash socket for type II Compact Flash storage card, four serial ports, one parallel port, and a 144-pin SODIMM socket allowing for up to 256MB of SDRAM to be installed.

1.1 Check List

The ROBO-2530VL package includes the following basic items accompany with this manual.

- 1 ROBO-2530VL All-in-One NS Geode GX1 Computing Module
- 1 Quick Installation Guide
- 1 CD-ROM contains the followings:
  - User's Manual (this manual in PDF file)
  - Ethernet driver and utilities
  - VGA drivers and utilities
  - Latest BIOS (as of the CD-ROM was made)
- Cable set includes the followings:
  - 1 PS/2 keyboard and mouse Y cable (10-pin, Mini-DIN)
  - 1 IDE HDD cable (44-pin, pitch 2.0mm)
  - 1 FDD cable (34-pin, pitch 2.0mm)
  - 1 bracket with one Printer port cable (26-pin, pitch 2.0mm) and one Serial port cable (10-pin, pitch 2.0mm)
  - 1 bracket with two serial port cable (10-pin, pitch 2.0mm)

If any of these items is damaged or missed, please contact your vendor and save all packing materials for future replacement and maintenance.

1. 2 Product Specifications

1.2.1 General Functions

- **Main processor**
  Onboard NS Geode GX1 300MHz, BGA package
- **BIOS**
  Award 256KB Flash BIOS
- **Chipset**
  NS Geode CS5530A
- **I/O Chipset**
  Winbond W83977F-A and W83977ATF-AW
- **Memory**
  Onboard one 144-pin SODIMM socket supports up to 256Mbytes SDRAM
- **Enhanced IDE**
  Supports one IDE device. Supports Ultra DMA/33 mode with data transfer rate up to 33MB/sec.
- **FDD interface**
  Supports up to two floppy disk drives, 5.25" (360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB)
- **Parallel port**
  Interface for bi-directional parallel port x 1. Supports SPP, ECP, and EPP modes
- **Serial port**
  One external DB-9 connector supports RS-232, three internal headers support RS-232 x1 RS-422/485 x2.
- **KB/Mouse connector**
  Internal header PS2 Keyboard/Mouse connector x 1
- **USB connectors**
  One down links two connectors supports dual USB ports
- **Watchdog Timer**
  Super watchdog timer from 0.5 to 64 sec by hardware count & software trigger.
- **DMA**
  7 DMA channels (8237 equivalent)
- **Interrupt**
  15 interrupt levels (8259 equivalent)
- **Power management**
  I/O peripheral devices support power saving and doze/standby/suspend modes. APM 1.2 compliant.

1.2.2 CRT Interface

- **Chipset**
  NS Geode CS5530A
- **Display memory**
  Shared display memory up to 4MB
- **Display type**
  Supports non-interlaced CRT
- **Resolution**
  1024x768x16 bpp

1.2.3 Ethernet Interface

- **Chipset**
  Dual Intel 82559 PCI-bus Ethernet controllers onboard
- **Ethernet interface**
  PCI 100/10 Mbps, IEEE 802.3U compatible
- **Remote Boot-ROM:** For diskless system

1.2.4 SSD Interface

- One CF socket supports Type II Compact Flash Card (Support 8-320MB Compact flash)

1.2.5 Expansion Interface

- One 16-bit 104-pin connector onboard
- One 32 bit 104 pulse connector onboard

1.2.6 Connectors

- **External connectors:** VGA (DB-15), COM 1 (DB-9), Ethernet (RJ-45), USB
- **Power connectors:** 4-pin HDD type, 4-pin FDD type

1.2.7 Mechanical and Environmental

- **Power supply voltage:** ±5V (±4.75V to ±5.25V), ±12V (±11.4V to ±12.6V)
- **Typical power requirement:** 5V @ 1.66A w/ GX1 300MHz
- **Operating temperature:** 32 to 140°F (0 to 50°C)
- **Board size:** 102mm x 145mm (3.5" FDD-size)

1.3 System Architecture

1.3.1 CPU/GX1 and CS5530A

The NS Geode GX1 along with the CS5530A companion chip provide the basic functionality and buses of the system:

- Interface to SDRAM, 64-bit data bus. PC100 compliant SDRAM must be used.
- PCI interface provided by GX1 CPU.
- VGA controller with video memory shared with system memory (UMA). The image data is transferred to the companion chip by means of *Pixel* bus.
- CRT interface. Data provided by the *Pixel* and *Video* interface from the CPU.
- Video interface from GX1 to the CS5530A. This data-stream is buffered and multiplexed with the *Pixel* bus for windowed video viewing. This interface may assist the processor in connection motion picture decoding.
- USB integrated in the CS5530A.
- IDE interface support Ultra DMA. Tow connectors are provided: A 44 pin pitch 2.0mm standard IDE interface on the primary and secondary controller and a Compact Flash connector on the secondary controller.

1.3.2 XPRESS Graphics

The XPRESS Graphics is based on the GX1 CPU and the CS5530A Companion chip and this graphics controller is very cost efficient since almost no additional components are required. This is achieved by using the SDRAM as frame-buffer and by integrating the graphics engine and display interface in the GX1 CPU and the CS5530A companion chip. This controller provides a CRT.

1.3.3 PCI Bus

The PCI-bus on the board is provided by the GX1 CPU and will always run at 33MHz.

The GX1 CPU provides support for up to three bus masters. These bus master signals are used by the CS5530A and the Intel 82559 Ethernet controller.

1.3.4 PC/104 Interface

The CS5530A companion chip provides a PCI-ISA Bridge that may operate in master or slave mode. ROBO-2530VL only support ISA slave mode. ISA master mode allows an ISA board to grant the bus and thereby get the bus master status. The bus master has the ability to generate bus cycles and thereby transfer data without involvement of the CPU or DMA (Direct memory access). However, ISA add-on card which utilizes the bus master mode is very rare today. A 104-pin PC/104 connector is equipped onboard for future expansion.

1.3.5 SDRAM Interface

This board uses SDRAM in the compact DIMM-144 form factor. 3.3V PC 100 SDRAM modules are recommended to use.

1.3.6 IDE Interface

A primary as well as a secondary IDE controller is provided by the CS5530A companion chip which supports Ultra DMA mode and PCI bus mastering for the data transfer.

Access to these controllers is provided by a standard IDC 44-pin connector and a Compact Flash type II connector on the solder side of this board.

1.3.7 USB

The USB interface provides two USB channels that are controlled by the CS5530A. The signals are provided by means of a down link 2 connector.

1.3.8 Ethernet

The Ethernet interfaces are based on one Intel 82559 Ethernet controller, which support both 100Mbit as well as l0Mbit Base-T interface.

The Ethernet controllers are attached to the PCI bus and use PCI bus mastering for data transfer. The CPU is thereby not loaded during the actual data transfer.

1.3.9 Winbond W83977F-A & D83977ATF-AW

The Winbond W83977F-A Super I/O chip provides most input / output interfaces of the system as the following:

- COM 1 & 2. Operates in RS-232 mode through a charge pump driver. Only 5V supply is required
- COM 3 & 4. A RS422/RS485 driver is used whereby RS-422 and RS-485 are provided. Selection of the mode is made by hardware jumper. Driver uses charge pumps whereby only +5V is required
- LPT. Support for SPP, EPP and ECP modes
- Floppy interface
- Keyboard interface
- PS/2 Mouse interface
- Provision of buffered ISA data bus for BIOS (denoted *XDBus)*
- NVRAM with battery backup for BIOS configuration and real time clock
- Watchdog timer

1.3.10 Compact Flash Interface

A Compact Flash type II connector is connected to the secondary IDE controller. The Compact Flash storage card is IDE compatible. It is an ideal replacement for standard IDE hard drives. The solid-state design offers no seek errors even under extreme shock and vibration conditions. The Compact Flash storage card is extremely small and highly suitable for rugged environments, thus providing an excellent solution for mobile applications with space limitations. It is fully compatible with all consumer applications designed for data storage PC card, PDA, and Smart Cellular Phones, allowing simple use for the end user. The Compact Flash storage card is O/S independent, thus offering an optimal solution for embedded systems operating in non-standard computing environments. The Compact Flash storage card is IDE compatible and offers various capacities.

The following block diagram shows the architecture and main components of ROBO-2530VL.

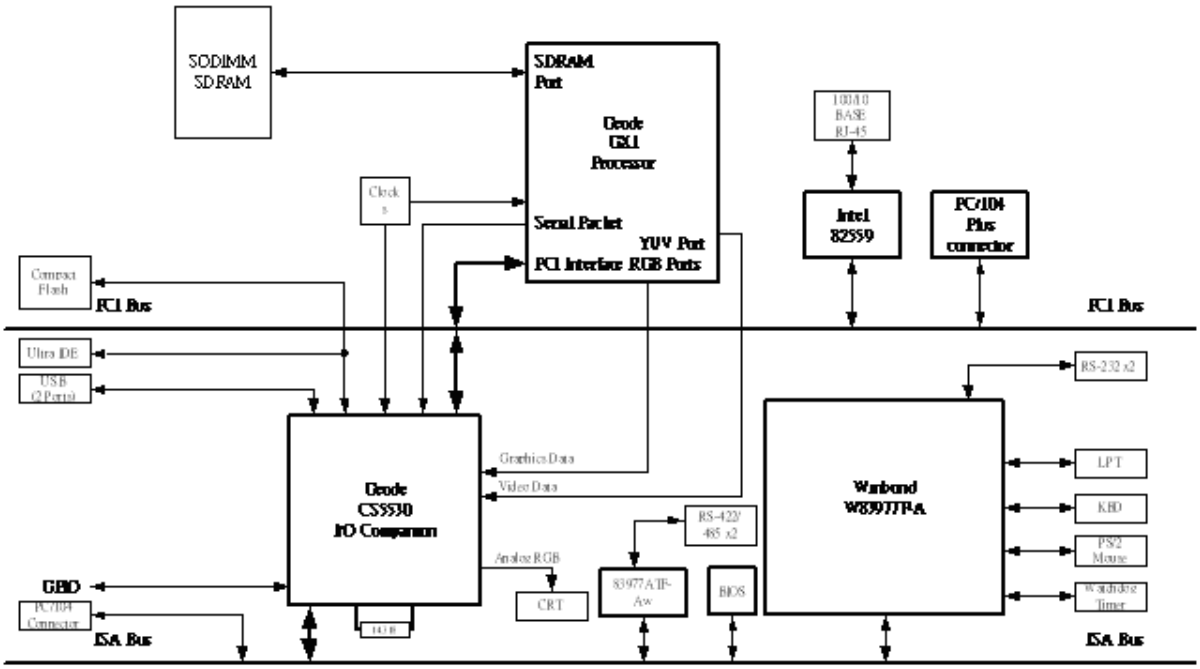
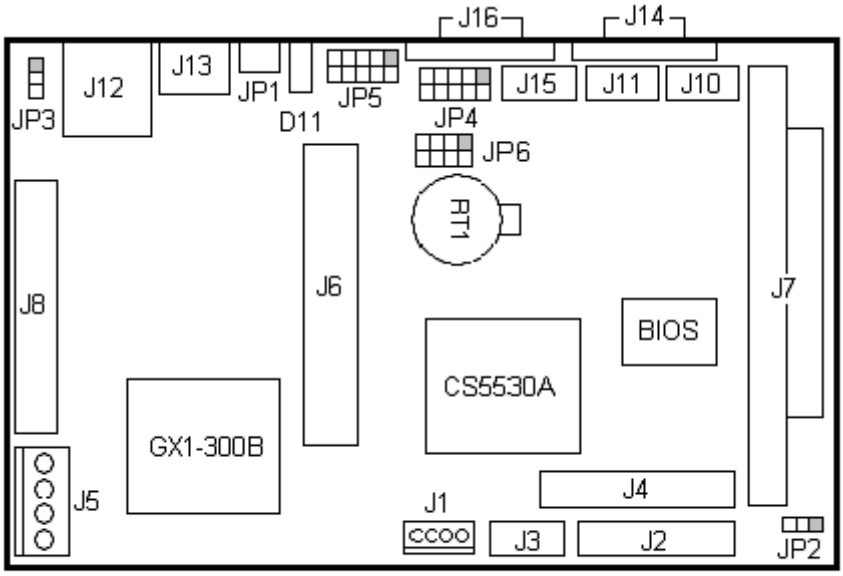


Figure 1-1 R0B0-2530VL System Block Diagram

The two key components on board are the NS Geode GX1 CPU and the CS5530A companion chip. These two devices provide the ISA and PCI bus to which all the major components are attached.

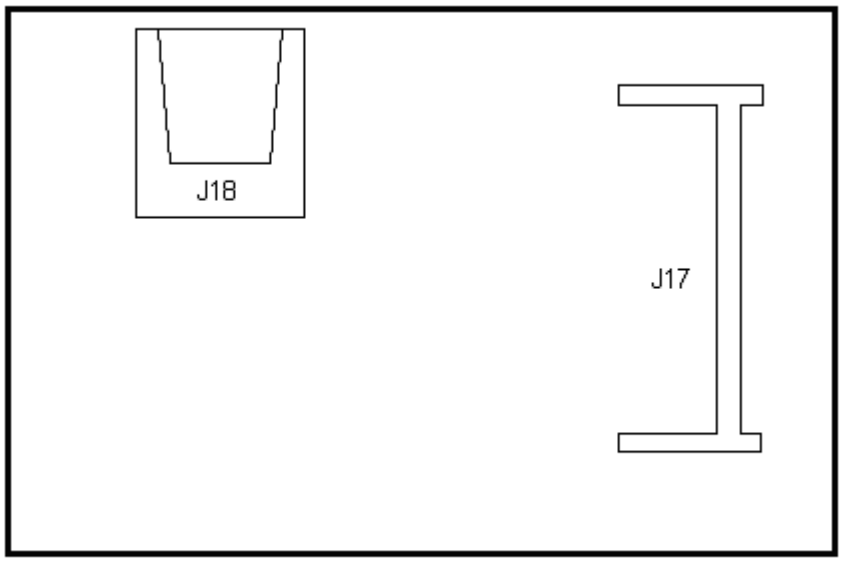
CHAPTER 2

Hardware Configuration Setting



ROBO-2530VL Z R1 (TOP VIEW)

Figure 2-1 ROBO-2530VL Jumper and Connector Locations (Top)

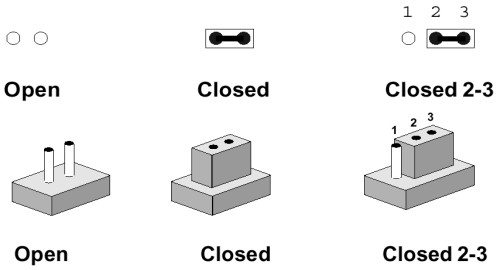


ROBO-2530VL Z R1 (BOTTOM VIEW)

Figure 2-2 ROBO-2530VL Jumper and Connector Locations (Bottom)

2.1 Jumper Setting

The jumper settings are schematically depicted in this manual as follows:



RTC CMOS Clear Jumper Setting (JP2)

JP2	Processor Selection
1-2	Normal Operation ★
2-3	Clear CMOS Contents

WATCH D On-board Ethernet enable/disable (JP3)

JP3	Processor Selection
1-2	On-board Ethernet Enabled ★
2-3	On-board Ethernet Disabled

OG TIMER Jumper Setting (JP4)

JP4 1-2	Processor Selection
NC	Watch DOG Timer Enabled
Short	Watch DOG Timer Disabled ★

JP4 3-4	IO Port Location
NC	533/033
Short	543/343 ★

JP4 5-6	*JP6 7-8*	*JP6 9-10*	*Twd*
Short	Short	Short	0.5 sec ★
Short	Short	NC	1 sec
Short	NC	Short	2 sec
Short	NC	NC	4 sec
NC	Short	Short	8 sec
NC	Short	NC	16 sec
NC	NC	Short	32 sec
NC	NC	NC	64 sec

RS-422/485 Select (JP6)

JP6	Processor Selection
1-2	RS-422 FOR J10
3-4	RS-485 FOR J10
5-6	RS-422 FOR J11
7-8	RS-485 FOR J11

2.2 Connectors

JP1: Reset Button

Function	Status
ON	Reset
OFF	Normal

J5 : Power Connector (HDD Type)

PIN No.	Signal Description
1	+12V
2	GND
3	GND
4	+5V

J6 : PC/104 Plus

PIN No.	A	B	C	D
1	GND/5.0V KEY	Reserve	+5	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0*	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1*	AD15	+3.3V
9	SERR*	GND	SB0*	PAR
10	GND	PERR*	+3.3V	SDONE
11	STOP*	+3.3V	LOCK*	GND
12	+3.3V	TRDY*	GND	DEVSEL*
13	FRAME*	GND	IRDY*	+3.3V
14	GND	AD16	+3.3V	C/BE2*
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3*	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REO0*	GND	REO1*	VI/O
24	GND	REO2*	+5V	GNT0*
25	GNT1*	VI/O	GNT2*	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD*	+5V	RST*
29	+12V	INTA*	INTB*	INTC*
30	-12V	Reserved	Reserved	GND/3.3V KEY^2

J7 PC/104 BUS

PIN No.	A	B
1	IOCHCK*	GND
2	D7	RSTDRV
3	D6	+5V
4	D5	IRQ9
5	D4	-5V
6	D3	DRQ2
7	D2	-12V
8	D1	ENDXFR*
9	D0	+12V
10	IOCHRDY	GND/KEY
11	AEN	SMEMW*
12	A19	SMEMR*
13	A18	IOW*
14	A17	IOR*
15	A16	DACK3*
16	A15	DRQ3
17	A14	DACK1*
18	A13	DRQ1
19	A12	REFRESH*
20	A11	SYSCLK
21	A10	IRQ7
22	A9	IRQ6
23	A8	IRQ5
24	A7	IRQ4
25	A6	IRQ3
26	A5	DACK2*
27	A4	TC
28	A3	BALE
29	A2	+5V
30	A1	OSC
31	A0	GND
32	GND	GND

PIN No.	C	D
0	GND	GND
1	MEMCS16*	SBHE*
2	IOCS16*	LA23
3	IRQ10	LA22
4	IRQ11	LS21
5	IRQ12	LS20
6	IRQ15	LS19
7	IRQ14	LA18
8	DACK0*	LA17
9	DRQ0	MEMR*
10	DACK5*	MEMW*
11	DRQ5	SD8
12	DACK6*	SB9
13	DRQ6	SD10
14	DACK7*	SD11
15	DRQ7	SD12
16	+5V	SD13
17	MASTER*	SD14
18	GND	SD15
19	GND	GND/KEY

J10/J11 : Serial Port-3/Port-4 Connector (2 x 5 shrouded header)

PIN No.	Signal Description
1	TX-
2	TX+
3	RX+
4	RX-
5	Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)
10	N/C

J8: IDE1 Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	RESET#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	N/C
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down
29	DMA ACK#	30	Ground
31	INT REQ	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground

J18 : Compact Flash Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	GND	2	D3
3	D4	4	D5
5	D6	6	D7
7	#CS0	8	A10
9	#ATA SEL	10	A9
11	A8	12	A7
13	VCC	14	A6
15	A5	16	A4
17	A3	18	A2
19	A1	20	A0
21	D0	22	D1
23	D2	24	#IOCS16
25	#CD2	26	#CD1
27	D11	28	D12
29	D13	30	D14
31	D15	32	#CS1
33	#VS1	34	#IORD
35	#IOWR	36	#WE
37	INTRQ	38	VCC
39	#CSEL	40	#VS2
41	#RESET	42	IORDY
43	#INPACK	44	#REG
45	#DASP	46	#PDIAG
47	D8	48	D9
49	D10	50	GND

J14/J15 : Serial Port-1/Port-2 Connector

PIN No.	Signal Description
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)

4	Data Terminal Ready (DTR)
5	Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)
10	N/C

J4 : FDC Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Density Select
3	Ground	4	N/C
5	Ground	6	N/C
7	Ground	8	Index#
9	Ground	10	Motor ENA#
11	Ground	12	Drive Select B#
13	Ground	14	Drive Select A#
15	Ground	16	Motor ENB#
17	Ground	18	Direction#
19	Ground	20	Step#
21	Ground	22	Write Data#
23	Ground	24	Write Gate#
25	Ground	26	Track 0#
27	Ground	28	Write Protect#
29	Ground	30	Read Data#
31	Ground	32	Head Select#
33	Ground	34	Disk Change#

J13 : USBx2 Interface Connector

PIN No.	Signal Description
1	+5V
2	USBD1/D2-
3	USBD1/D2+
4	USBGND1
5	GND

J12 : Ethernet RJ-45 Interface Connector

PIN No.	Signal Description
1	TX+
2	TX-
3	RX+
4	Termination to Ground
5	Termination to Ground
6	RX-
7	Termination to Ground
8	Termination to Ground

J12 : Input Power Connector (1 x 4 shrouded header)

PIN No.	Signal Description
1	12V
2	GND
3	GND
4	5V

J2 : Parallel Port Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialization#
4	Data 2	17	Printer Select IN#
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground

9	Data 7	22	Ground
10	Acknowledge #	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select	26	N/C

J3 : PS/2 Keyboard/Mouse Connector

PIN No.	Signal Description
1	Keyboard Data
2	N/C
3	GND
4	+5V
5	Keyboard Clock
6	N/C
7	Mouse Data
8	N/C
9	GND
10	+5V
11	Mouse Clock
12	N/C

J16 : On-board VGA DSUB-15 Connector

PIN No.	Signal Description
1	R
2	G
3	B
4	N/C
5	Ground
6	Ground
7	Ground
8	Ground
9	N/C
10	Ground
11	N/C
12	DDC_DATA
13	HSYNC
14	VSYNC
15	DDC_CLK

D11 : IDE1/Campact Flash Active LED (Green) (What is D….)

Function	Status
ON	Active
OFF	Non- Active

D11 : Power LED (Yellow)

Function	Status
ON	Power is Ready
OFF	Power is OFF

J1 : Input Power Connector (1 x 4 shrouded header)

PIN No.	Signal Description
1	-12V
2	GND
3	GND
4	-5V

JP5 : GPIO Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	GPI 0	2	GPO 0
3	GPI 1	4	GPO 1
5	Ground	6	Ground
7	GPI 2	8	GPO 2
9	GPI 3	10	GPO 3

CHAPTER 3

System Installation

This chapter provides you with instructions on how to set up your computer system using ROBO-2530VL Panel Computer Board. The additional information shows you how to install Ethernet, Graphic in Operating System.

3.1 Graphic Driver installation for NS Geode GX1 XpressGRAPHICS

The on chip XPRESS Graphics is based on the GX1 CPU and the CS5530A Companion chip and this graphics controller is very cost efficient since almost no additional components are required. This is achieved by using the SDRAM as frame-buffer and by integrating the graphics engine and display interface in the GX1 CPU and the CS5530A companion chip. This controller provides a CRT:

Driver Support

ROBO-2530VL provides one CD-Title to support on-board VGA device drivers in various operating systems. Before installing the device driver, please see the reference files in each sub-directory. **If you have problems to install drivers directly from CDROM, please copy the files into your hard drive before you proceed with the driver installation.**

- **VGA**: This driver supports Windows-4.0, Windows-9X.

Notice
For more detailed installation steps, please refer to our installation guide file.

3.2 Ethernet

The Ethernet interfaces are based on one Intel 82559 Ethernet controller, which support both 100Mbit as well as l0Mbit Base-T interface.

The Ethernet controllers are attached to the PCI bus and use PCI bus mastering for data transfer. The CPU is thereby not loaded during the actual data transfer.

Driver Support

ROBO-2530VL provides one CD-Title to support on-board Ethernet device drivers in various operating systems. Before installing the device driver, please see the reference files in each sub-directory. **If you have problems to install drivers directly from CDROM, please copy the files into your hard drive before you proceed with the driver installation.**

- **Ethernet**: This driver supports Windows-4.0, Windows-9X.

Notice
For more detailed installation steps, please refer to our installation guide file.

3.3 IDE interface

A primary as well as a secondary IDE controller is provided by the CS5530A companion chip which supports Ultra DMA mode and PCI bus mastering for the data transfer.

Access to these controllers is provided by a standard IDC 44-pin connector and a Compact Flash type II connector on the solder side of this board.

3.4 PCI bus

The PCI-bus on the board is provided by the GX1 CPU and will always run at 33MHz.

The GX1 CPU provides support for up to three bus masters. These bus-master signals are beign used by the CS5530A and one Intel 82559 Ethernet controller.

3.5 SDRAM interface

This board uses 144 pin SODIMM. 3.3V PC 100 SDRAM modules are recommended

to use.

3.6 USB

The USB interface provides two USB channels that are controlled by the CS5530A. The signals are provided by means of a down link 2 connectors/.

3.7 Compact Flash interface

A Compact Flash type II connector is connected to the secondary IDE controller. The Compact Flash storage card is IDE compatible. It is an ideal replacement for standard IDE hard drives. The solid-state design offers no seek errors even under extreme shock and vibration conditions. The Compact Flash storage card is extremely small and highly suitable for rugged environments, thus providing an excellent solution for mobile applications with space limitations. It is fully compatible with all consumer applications designed for data storage PC card, PDA, and Smart Cellular Phones, allowing simple use for the end user. The Compact Flash storage card is O/S independent, thus offering an optimal solution for embedded systems operating in non-standard computing environments. The Compact Flash storage card is IDE compatible and offers various capacities.

3.8 Winbond W83977F-A & W83977ATF-AW

The Winbond W83977F-A Super I/O chip provides most input / output interfaces of the system as the following:

- COM 1, COM2. Operates in RS-232 mode through a charge pump driver. Only 5V supply is required
- COM 3, COM 4. A /RS422/RS485 driver is used whereby RS-422 and RS-485 are provided. Selection of the mode is made by hardware jumper. Driver uses charge pumps whereby only +5V is required
- LPT. Support for SPP, EPP and ECP modes
- Floppy interface
- Keyboard interface
- PS/2 Mouse interface
- NVRAM with battery backup for BIOS configuration and real time clock
- Watchdog timer

CHAPTER 4

AWARD BIOS Setup

4.1 Starting Setup

The Award BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <Del> immediately after switching the system on, or

By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 To Continue, DEL to enter SETUP

4.2 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exitcurrent page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option PageSetup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Calendar, only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3 Getting Help

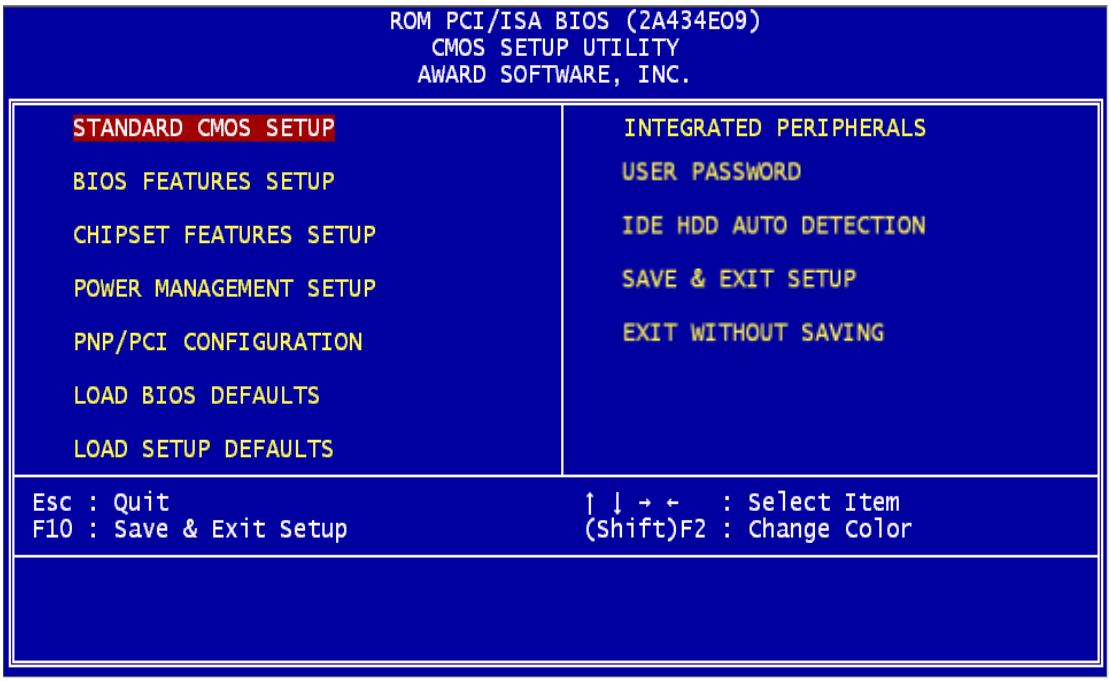
Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

4.4 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the Award BIOS supports an override to the CMOS settings which resets your system to its defaults.

4.5 Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.



4.5.1 Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

4.5.1.1 Standard CMOS Setup

This setup page includes all the items in a standard, AT-compatible BIOS.

4.5.1.2 BIOS Features Setup

This setup page includes all the items of Award special enhanced features.

4.5.1.3 Super / User Password Setting

Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.

4.5.1.4 Chipset Features Setup

This setup page includes all the items of chipset special features.

4.5.1.5 Power Management Setup

This entry only appears if your system supports Power Management, "Green PC", standards.

4.5.1.6 PNP / PCI Configuration Setup

This entry appears if your system supports PNP / PCI.

4.5.1.7 Load BIOS Defaults

The BIOS defaults settings provide the minimum requirements for your system to operate.

4.5.1.8 Load Setup Defaults

The chipset defaults are settings, which provide for maximum system performance. While Award has designed the custom BIOS to maximize performance, the manufacturer has the right to change these defaults to meet their needs.

4.5.1.9 Integrated Peripherals

This section page includes all the items of IDE hard drive and Programmed Input / Output features.

4.5.1.10 IDE HDD Auto Detection

Automatically detect and configure hard disk parameters. The Award BIOS includes this ability in the event you are uncertain of your hard disk's parameters.

4.5.1.11 Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

4.5.1.12 Exit Without Save

Abandon all CMOS value changes and exit setup.

Standard CMOS Setup Reference Table

This setup reference table includes all the Optimal, Failsafe, and Other options setting in each BIOS setup item. It is very easy to cross reference. If you want to go details, you can directly refer to item description in sub-section.

- **BIOS Features Setups Table**

BIOS Setup Items	BIOS Default	Setup Default	Other Options
Virus Warning	Disabled	Disabled	Enabled
CPU internal Cache	Enabled	Enabled	Disabled
Quick Power On Self Test	Disabled	Enabled	
Boot Sequence	A, C, SCSI	A, C, SCSI	CD-ROM, SCSI, LS/ZIP,
Swap Floppy Drive	Disabled	Disabled	Enabled
Boot Up Floppy Seek	Enabled	Enabled	Disabled
Boot Up NumLock Status	On	On	Off
Boot Up System Speed	High	High	Low
Gate A20 Option	Fast	Fast	Normal
Memory Parity Check	Enabled	Enabled	Disabled
Typematic Rate Setting	Disabled	Disabled	Enabled
Typematic Rate (Chars/Sec)	6	6	8, 10, 12, 15, 20, 24, 30
Typematic Delay (Msec)	250	250	500, 750, 1000
Security Option	Setup	Setup	System
PCI / VGA Palette Snoop	Disabled	Disabled	Enabled
OS Select for DRAM > 64	Non-OS2	Non-OS2	OS2
Report No FDD for WIN95	Yes	Yes	No
Video BIOS Shadow	Enabled	Enabled	Disabled
C8000 - CBFFF Shadow/DC000 - DFFFF Shadow	Disabled	Disabled	Enabled
Cyrix 6*86/MII CPUD	Enabled	Enabled	Disabled

● Chipset Features Setup Table

BIOS Setup Items	BIOS Default	Setup Default	Other Options
SDRAM CAS latency Time	3T	3T	2T, Auto
SDRAM Clock Ratio Div By	4	4	
16-bit I/O Recovery (CLK)	5	5	1, … , 16
8-bit I/O Recovery (CLK)	5	5	1, … , 16
USB Controller / USB Legacy Support	Enabled	Enabled	Disabled
Multiple Monitor Support	M/B first	M/B first	PCI First
Video Memory Size	4.0M	4.0M	None, 1.5M, 2.5M

● Integrated Peripherals Features Setup Table

BIOS Setup Items	BIOS Default	Setup Default	Other Options
IDE HDD Block Mode	Enabled	Enabled	Disabled
Primary/Secondary IDE Channel	Enabled	Enabled	Disabled
IDE Primary/Secondary Master/Slave PIO Mode	Auto	Auto	0, …, 4
IDE Primary/Secondary Master/Slave UDMA	Auto	Auto	Enabled
KBC Input Clock	8MHz	8MHz	6MHz, 12MHz, 16MHz
Onboard FDC Controller	Enabled	Enabled	Disabled
Onboard Serial Port 1/Port 2	3F8/IRQ4, 2F8/IRQ3,	3F8/IRQ4, 2F8/IRQ3,	3E8/IRQ4,2E8/IRQ3, Disabled, Auto.
Onboard Serial Port 3/Port 4	3E8/IRQ9, 2E8/IRQ10	3E8/IRQ9, 2E8/IRQ10	3F8, 2F8, IRQ3,4,5,6,7,11
Onboard Parallel Port	378/IRQ7	378/IRQ7	278/IRQ5, Disabled.
Parallel Port Mode	SPP	SPP	ECP, EPP, ECP+EPP
ECP Mode Use DMA	3	3	1
EPP Mode Select	EPP1.9	EPP1.9	EPP1.7
GPIO Port	200/202H	200/202H	300/302H, 400/402H

Power Management Setup Table

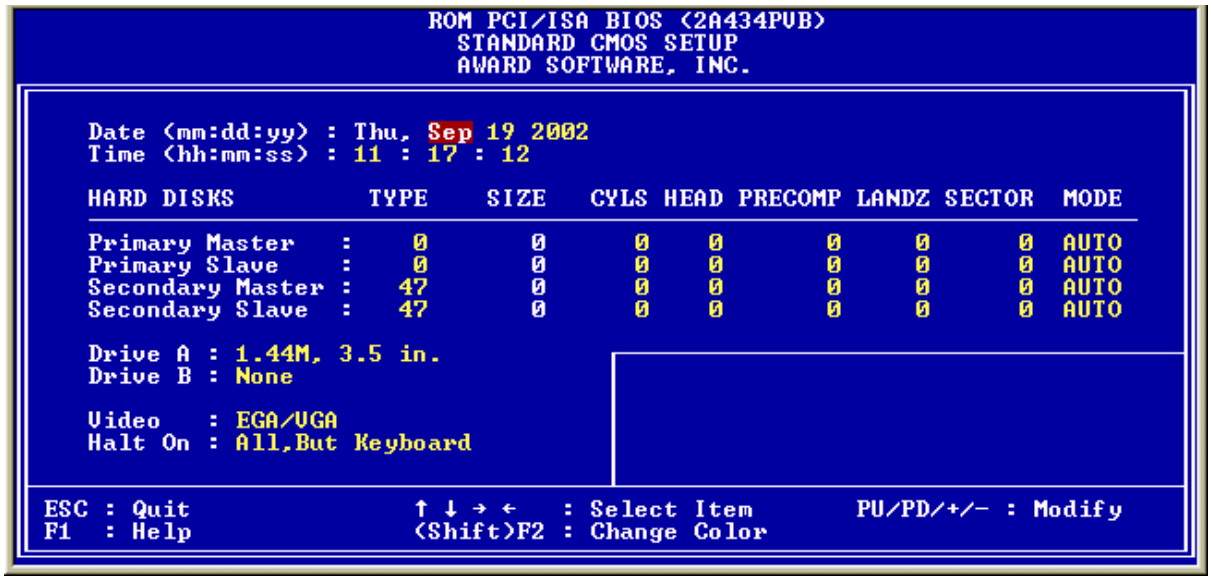
BIOS Setup Items	BIOS Default	Setup Default	Other Options
Power Management	Disabled	Disabled	Min. Power Saving, Max. Power Saving, User Defined
Doze Mode	Disabled	Disabled	Enabled
Standby Mode	Disabled	Disabled	Enabled
HDD Power Down	Disabled	Disabled	Enabled
MODEM Use IRQ	NA	NA	3, 4, 5, 7, 9, 10, 11
Throttle Duty Cycle	33.3%	33.3%	12.5%, 50%, 75%.
Power Down & Resume Events	On	On	Off
IRQ1 (Keyboard)	On	On	Off
IRQ3 (COM 2)	Off	Off	On
IRQ4 (COM1)	Off	Off	On
IRQ5 (LPT 2)	Off	Off	On
IRQ6 (Floppy Disk)	Off	Off	On
IRQ7 (LPT 1)	Off	Off	On
IRQ9 (IRQ2 Redir)	Off	Off	On
IRQ10 (Reserved)	Off	Off	On
IRQ11 (Reserved)	Off	Off	On
IRQ12 (PS/2 Mouse)	Off	Off	On
IRQ13 (Coprocessor)	Off	Off	On
IRQ14 (Hard Disk)	Off	Off	On
IRQ15 (Reserved)	Off	Off	On

PnP/PCI Configuration Setup Table

BIOS Setup Items	BIOS Default	Setup Default	Other Options
PnP OS Installed	No	No	Yes
Resource Controlled By	Auto	Auto	Manual
Reset Configuration Data	Disabled	Disabled	Enabled
PCI IRQ Activated By	Level	Level	Edge

4.5.2 Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.


ROM PCI/ISA BIOS (2A434PVB)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.
Date (mm:dd:yy) : Thu, Sep 19 2002
Time (hh:mm:ss) : 11 : 17 : 12
HARD DISKS TYPE SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE
Primary Master : 0 0 0 0 0 0 0 AUTO
Primary Slave : 0 0 0 0 0 0 0 AUTO
Secondary Master : 47 0 0 0 0 0 0 AUTO
Secondary Slave : 47 0 0 0 0 0 0 AUTO
Drive A : 1.44M, 3.5 in.
Drive B : None
Video : EGA/VGA
Halt On : All,But Keyboard
ESC : Quit
F1 : Help
↑ ↓ → ← : Select Item
(Shift)F2 : Change Color
PU/PD/+/- : Modify

4.5.2.1 Date

The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

Day	The day, from Sun to Sat, determined by the BIOS and is display-only
Date	The date, from 1 to 31 (or the maximum allowed in the month)
Month	The month, Jan through Dec.
Year	The year, from 1900 through 2099

4.5.2.2 Time

The time format is <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

4.5.2.3 Daylight Saving

The category adds one hour to the clock when daylight-saving time begins. It also subtracts one hour when standard time returns.

Enabled	Enable daylight-saving
Disabled	Disable daylight-saving

4.5.2.4 Primary Master/Primary Slave/Secondary Master/Secondary Slave

The categories identify the types of 2 channels that have been installed in the computer. There are 45 predefined types and 4 user definable types are for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type user is user-definable.

Press PgUp or PgDn to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type "User" to define your own drive type manually.

If you select Type "User", you will need to know the information listed below. Enter the information directly from the keyboard and press <Enter>. This information should be included in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be "Type 1".

If the controller of HDD interface is SCSI, the selection shall be "None". If you select Type "Auto", BIOS will Auto-Detect the HDD & CD-ROM Drive at the POST stage and showing the IDE for HDD & CD-ROM Drive.

TYPE	drive type
CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precomp
LANDZONE	landing zone
SECTORS	number of sectors
MODE	mode type

If a hard disk has not been installed select NONE and press <Enter>.

4.5.2.5 Drive A Type / Drive B Type

The category identifies the types of floppy disk drive A or drive B that have been installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

4.5.2.6 Video

The category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type in Setup.

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

4.5.2.7 Halt On

The category determines whether the computer will stop if an error is detected during power up.

No errors	The system boot will not be stopped for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

4.5.2.8 Memory

The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

4.5.2.9 Base Memory

The POST will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the SBC, or 640K for systems with 640K or more memory installed on the SBC.

4.5.2.10 Extended Memory

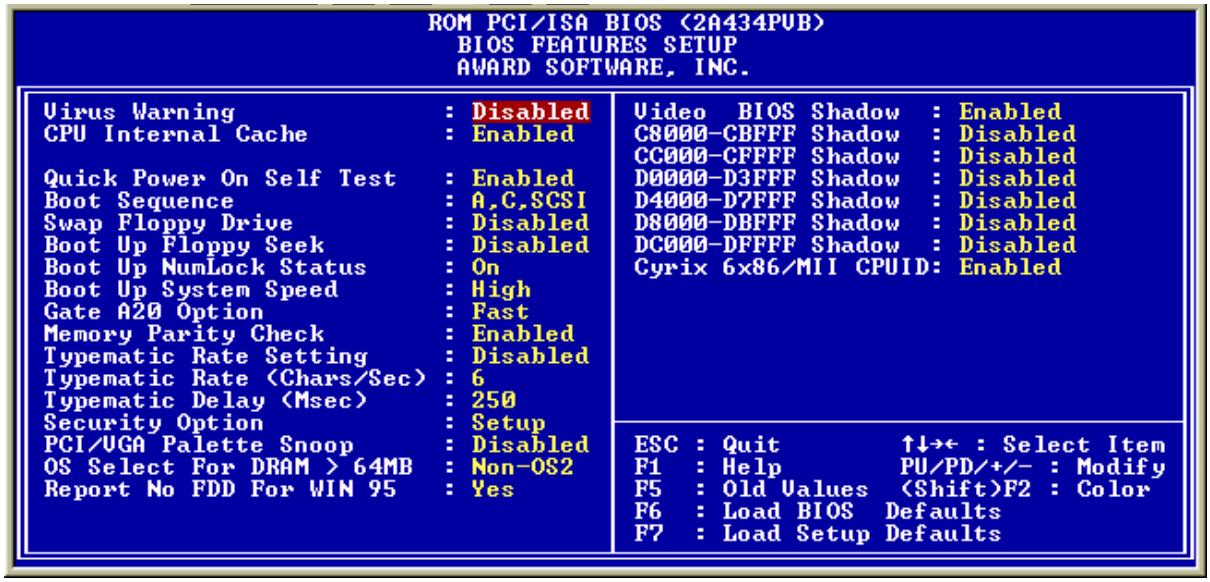
The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

4.5.2.11 Other Memory

This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers in an effort to keep as much base memory free for application programs. The BIOS is the most frequent user of this RAM area since this is where it shadows RAM.

4.5.3 BIOS Features Setup

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.


ROM PCI/ISA BIOS (2A434PUB)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.
Virus Warning : Disabled
CPU Internal Cache : Enabled
Quick Power On Self Test : Enabled
Boot Sequence : A,C,SCSI
Swap Floppy Drive : Disabled
Boot Up Floppy Seek : Disabled
Boot Up NumLock Status : On
Boot Up System Speed : High
Gate A20 Option : Fast
Memory Parity Check : Enabled
Typematic Rate Setting : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec) : 250
Security Option : Setup
PCI/VGA Palette Snoop : Disabled
OS Select For DRAM > 64MB : Non-OS2
Report No FDD For WIN 95 : Yes
Video BIOS Shadow : Enabled
C8000-CBFFF Shadow : Disabled
CC000-CFFFF Shadow : Disabled
D0000-D3FFF Shadow : Disabled
D4000-D7FFF Shadow : Disabled
D8000-DBFFF Shadow : Disabled
DC000-DFFFF Shadow : Disabled
Cyrix 6x86/MII CPUID: Enabled
ESC : Quit
↑↓→← : Select Item
F1 : Help
PU/PD/+/- : Modify
F5 : Old Values
(Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

4.5.3.1 Virus Warning

When this item is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive for any attempt at modification. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

> ! WARNING !
>
> Disk boot sector is to be modified
>
> Type "Y" to accept write or "N" to abort write
>
> Award Software, Inc.

4.5.3.2 CPU Internal Cache

This category speeds up memory access. However, it depends on CPU/chipset design. The default value is en able.

Enabled	Enable cache
Disabled	Disable cache

4.5.3.3 Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Enabled	Enable quick POST
Disabled	Normal POST

4.5.3.4 Boot Sequence

This category determines which drive to search first for the disk operating system (i.e., DOS). Default value is A, C.

C, A	System will first search for hard disk drive then floppy disk drive.
A, C	System will first search for floppy disk drive then hard disk drive.
CDROM, C, A	System will first search for CDROM drive, then hard disk drive and the next is floppy disk drive.
C, CDROM, A	System will first search for hard disk drive, then CDROM drive, and the next is floppy disk drive.

4.5.3.5 Swap Floppy Drive

This item allows you to determine whether enable the swap floppy drive or not.
The choice: Enabled/Disabled.

4.5.3.6 Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS cannot tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K.

4.5.3.7 Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on.

On	Keypad is number keys
Off	Keypad is arrow keys

4.5.3.8 Boot Up System Speed

Selects the default system speed -- the normal operating speed at power up.

High	Set the speed to high
Low	Set the speed to low

4.5.3.9 Gate A20 Option

This entry allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbytes. Initially, the gate A20 was handled via a pin on the keyboard. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

Normal	Keyboard
Fast	Chipset

4.5.3.10 Typematic Rate Setting

This determines if the typematic rate is to be used. When disabled, continually holding down a key on your keyboard will generate only one instance. In other words, the BIOS will only report that the key is down. When the typematic rate is enabled, the BIOS will report as before, but it will then wait a moment, and, if the key is still down, it will begin the report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys.

Enabled	Enable typematic rate
Disabled	Disable typematic rate

4.5.3.11 Typematic Rate (Chars/Sec)

When the typematic rate is enabled, this selection allows you select the rate at which the keys are accelerated.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

4.5.3.12 Typematic Delay (Msec)

When the typematic rate is enabled, this selection allows you to select the delay between when the key was first depressed and when the acceleration begins.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

4.5.3.13 Security Option

This category allows you to limit access to the system and Setup, or just to Setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

4.5.3.14 PCI / VGA Palette Snoop

It determines whether the MPEG ISA/VESA VGA Cards can work with PCI/VGA or not.

Enabled	When PCI/VGA working with MPEG ISA/VESA VGA Card.
Disabled	When PCI/VGA not working with MPEG ISA/VESA VGA Card.

4.5.3.15 OS Select for DRAM > 64

This item allows you to access the memory that over 64MB in OS/2.

The Choice: Non-OS2, OS2.

4.5.3.16 Report No FDD for WIN95

4.5.3.17 Video BIOS Shadow

Determines whether video BIOS will be copied to RAM. However, it is optional depending on chipset design. Video Shadow will increase the video speed.

Enabled	Video shadow is enabled
Disabled	Video shadow is disabled

4.5.3.18 CBFFF Shadow/DC000 - DFFFF Shadow

These categories determine whether option ROMs will be copied to RAM. An example of such option ROM would be support of on-board SCSI.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

4.5.3.19 Cyrix, 6x86/Mii CPUID.

4.5.4 Supervisor/User Password Setting

Password: just can only enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

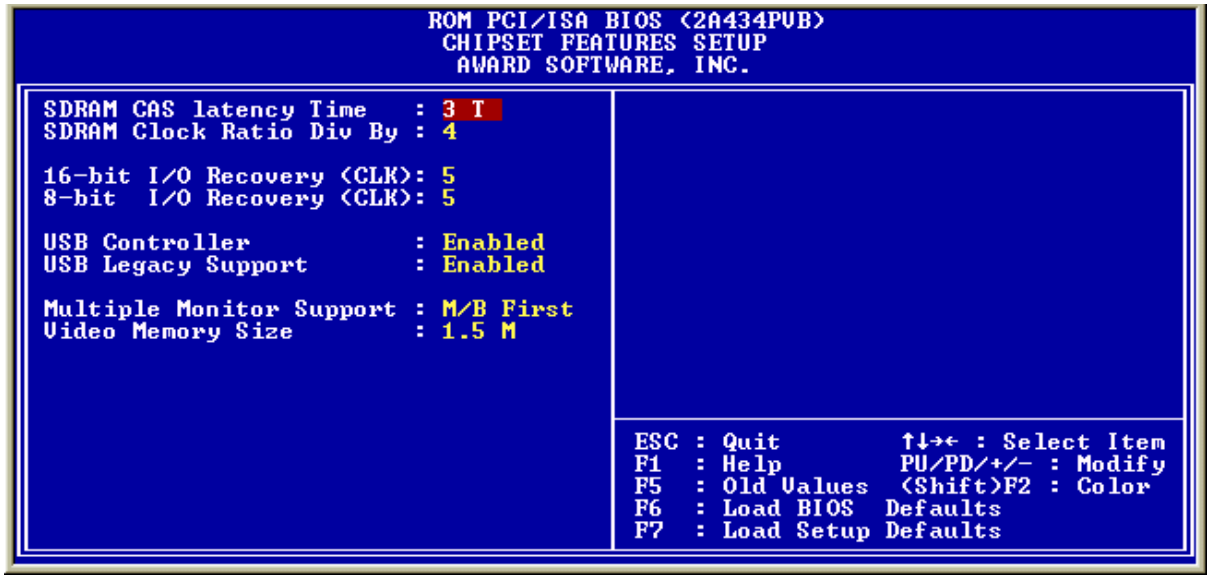
PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

4.5.5 Chipset Features Setup


ROM PCI/ISA BIOS (2A434PUB)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.
SDRAM CAS latency Time : 3 T
SDRAM Clock Ratio Div By : 4
16-bit I/O Recovery (CLK): 5
8-bit I/O Recovery (CLK): 5
USB Controller : Enabled
USB Legacy Support : Enabled
Multiple Monitor Support : M/B First
Video Memory Size : 1.5 M
ESC : Quit
F1 : Help
F5 : Old Values
F6 : Load BIOS Defaults
F7 : Load Setup Defaults
↑↓→← : Select Item
PU/PD/+/- : Modify
(Shift)F2 : Color

ADVANCED OPTIONS. The parameters in this screen are for system designers, service personnel, and technically competent users only. Do not reset these values unless you understand the consequences of your changes.

4.5.5.1 SDRAM CAS latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

The Choice: Auto, 2T, 3T.

4.5.5.2 SDRAM Clock Ratio Div By

This item allows user to set the DRAM timing.

4.5.5.3 16-bit I/O Recovery (CLK)

The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus.

The Choice: from 1 to 16 CPU clocks.

4.5.5.4 8-bit I/O Recovery (CLK)

The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus.

This item allows you to determine the recovery time allowed for 8-bit I/O.

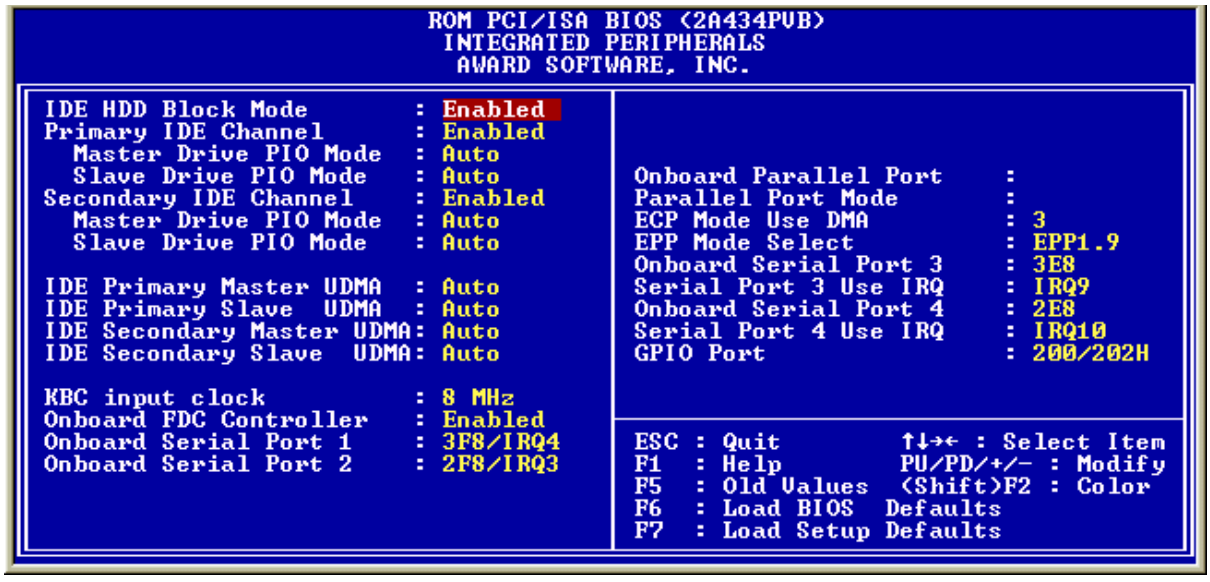
The Choice: from 1 to 16 CPU clocks.

4.5.5.5 USB Controller / USB Legacy Support

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

The Choice: Enabled, Disabled.

4.5.6 Integrated Peripherals Features Setup


ROM PCI/ISA BIOS (2A434PVB)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.
IDE HDD Block Mode : Enabled
Primary IDE Channel : Enabled
Master Drive PIO Mode : Auto
Slave Drive PIO Mode : Auto
Secondary IDE Channel : Enabled
Master Drive PIO Mode : Auto
Slave Drive PIO Mode : Auto
IDE Primary Master UDMA : Auto
IDE Primary Slave UDMA : Auto
IDE Secondary Master UDMA: Auto
IDE Secondary Slave UDMA: Auto
KBC input clock : 8 MHz
Onboard FDC Controller : Enabled
Onboard Serial Port 1 : 3F8/IRQ4
Onboard Serial Port 2 : 2F8/IRQ3
Onboard Parallel Port :
Parallel Port Mode :
ECP Mode Use DMA : 3
EPP Mode Select : EPP1.9
Onboard Serial Port 3 : 3E8
Serial Port 3 Use IRQ : IRQ9
Onboard Serial Port 4 : 2E8
Serial Port 4 Use IRQ : IRQ10
GPIO Port : 200/202H
ESC : Quit ↑↓→← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

4.5.6.1 IDE HDD Block Mode

This allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

Enabled	IDE controller uses block mode.
Disabled	IDE controller uses standard mode.

4.5.6.2 Primary/Secondary IDE Channel

You may separately disable the primary/second channel on an IDE interface installed in a PCI expansion slot.

4.5.6.3 IDE Primary/Secondary Master/Slave PIO Mode

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports.

Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

4.5.6.4 IDE Primary/Secondary Master/Slave UDMA

This item allows you to enable/disable the IDE Primary/Secondary Master / Slave UDMA mode.

The Choice: Auto, Disabled

4.5.6.5 KBC Input Clock

This item allows you to select the KBC input clock frequency.

The Choice: 6MHz, 8MHz, 12MHz, 16MHz.

4.5.6.6 Onboard FDD Controller

This should be enabled if your system has a floppy disk drive (FDD) installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

The Choice: Enabled, Disabled.

4.5.6.7 Onboard Serial Port 1/Port 2

This item allows you to determine access onboard serial port 1/port 2 controller with which I/O address.

The Choice: 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Disabled, Auto.

4.5.6.8 Onboard Serial Port 3/Port 4

This item allows you to determine access onboard serial port 3/port 4 controller with which I/O address.

The Choice: 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Disabled, Auto.

4.5.6.9 Onboard Parallel Port

Select a logical LPT port name and matching address for the physical parallel (printer) port.

The Choice: 378H/IRQ7, 278H/IRQ5, 3BCH/IRQ7, Disabled.

4.5.6.10 Parallel Port Mode

Select an operating mode for the onboard parallel port. Select Compatible or Extended unless you are certain both your hardware and software support EPP or ECP mode.

The Choice: ECP+EPP1.7, EPP1.7+SPP, EPP1.9+SPP, ECP+EPP1.9, ECP, Normal, SPP.

4.5.6.11 ECP Mode Use DMA

Select a DMA channel for the port.

The Choice: 3, 1.

4.5.6.12 EPP Mode Select

Select EPP port type 1.7 or 1.9.

The Choice: EPP1.7, EPP1.9.

4.5.6.13 GPIO Port

Select GPIO port I/O port address: GPI port address / GPO port address.

GPI port address: 200H/300H/400H

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
X	X	X	X	GPI 3	GPI 2	GPI 1	GPI 0

GPO port address: 202H/302H/402H

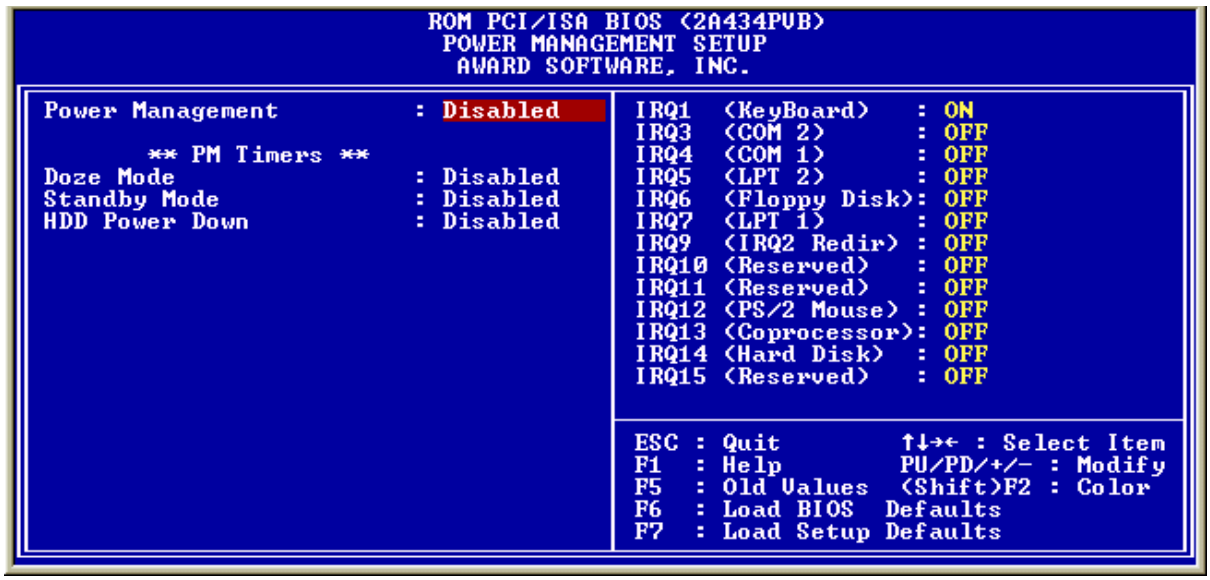
bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
X	X	X	X	GPO 3	GPO 2	GPO 1	GPO 0

X: Don't care.

The Choice: 200/202H, 300/302H, 400/402H.

4.5.7 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.


ROM PCI/ISA BIOS (2A434PUB)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.
Power Management : Disabled
** PM Timers **
Doze Mode : Disabled
Standby Mode : Disabled
HDD Power Down : Disabled
IRQ1 (KeyBoard) : ON
IRQ3 (COM 2) : OFF
IRQ4 (COM 1) : OFF
IRQ5 (LPT 2) : OFF
IRQ6 (Floppy Disk): OFF
IRQ7 (LPT 1) : OFF
IRQ9 (IRQ2 Redir) : OFF
IRQ10 (Reserved) : OFF
IRQ11 (Reserved) : OFF
IRQ12 (PS/2 Mouse) : OFF
IRQ13 (Coprocessor): OFF
IRQ14 (Hard Disk) : OFF
IRQ15 (Reserved) : OFF
ESC : Quit ↑↓→← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

4.5.7.1 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. Doze Mode
2. Standby Mode
3. HDD Power Down

There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU's**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

4.5.7.2 PM Timers

The following four modes are Green PC power saving functions which are only user configurable when *User Defined* Power Management has been selected. See above for available selections.

4.5.7.2.1 Doze Mode

When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.

4.5.7.2.2 Standby Mode

When enabled and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.

4.5.7.2.3 HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

4.5.7.3 Power Down & Resume Events

Power Down and Resume events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as *On*, even when the system is in a power down mode.

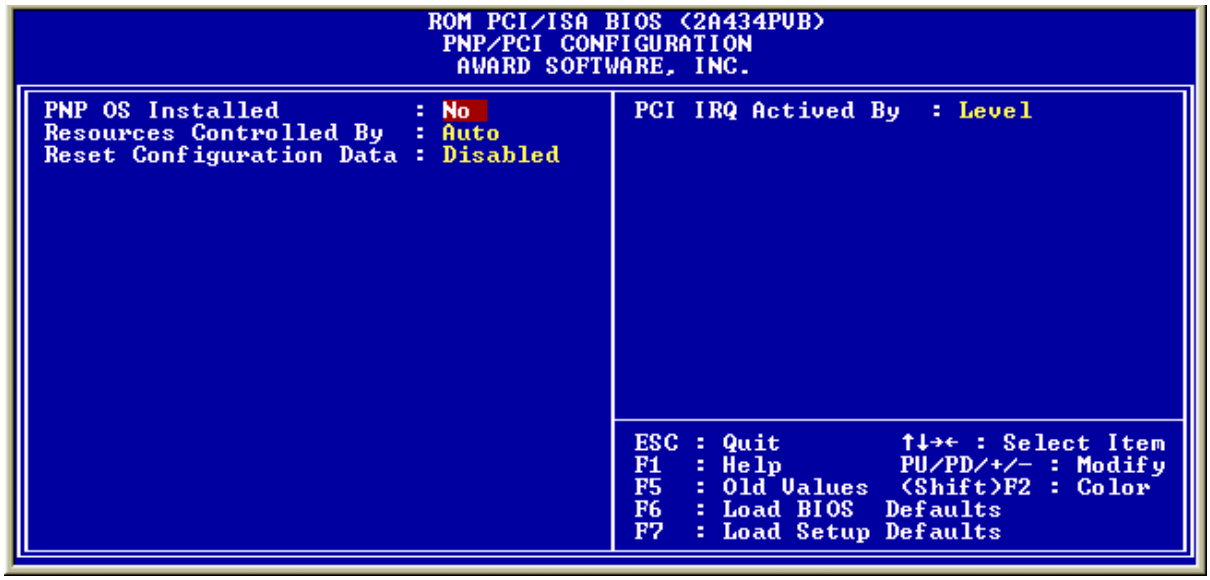
The following is a list of IRQ's, **I**nterrupt **R**e**Q**uests, which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

As above, the choices are *On* and *Off*. *Off* is the default.
When set *Off*, activity will neither prevent the system from going into a power management mode nor awaken it.

- IRQ1 (Keyboard)
- IRQ3 (COM 2)
- IRQ4 (COM1)
- IRQ5 (LPT 2)
- IRQ6 (Floppy Disk)
- IRQ7 (LPT 1)
- IRQ9 (IRQ2 Redir)
- IRQ10 (Reserved)
- IRQ11 (Reserved)
- IRQ12 (PS/2 Mouse)
- IRQ13 (Coprocessor)
- IRQ14 (Hard Disk)
- IRQ15 (Reserved)

4.5.8 PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.


ROM PCI/ISA BIOS (2A434PUB)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.
PNP OS Installed : No
Resources Controlled By : Auto
Reset Configuration Data : Disabled
PCI IRQ Actived By : Level
ESC : Quit
F1 : Help
F5 : Old Values
F6 : Load BIOS Defaults
F7 : Load Setup Defaults
↑↓→← : Select Item
PU/PD/+/- : Modify
(Shift)F2 : Color

4.5.8.1 PnP OS Installed

This determines whether the PnP OS is installed or not.

Choices are *Yes* and *No*.

4.5.8.2 Resource Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95.

Choices are *Auto* and *Manual*.

4.5.8.3 Reset Configuration Data

This item allows you to determine reset the configuration data or not.

Choices are *Enabled* and *Disabled*.

4.5.8.4 IRQ - *X* / DMA – *X* Assigned To

This item allows you to determine the IRQ / DMA assigned to the ISA bus and is not available to any PCI slot.

Choices are Legacy ISA and PCI/ISA PnP.

4.5.8.5 PCI IRQ Activated By

This sets the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless advised otherwise by your system's manufacturer.

Choices are *Level* and *Edge*.